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ABSTRACT

Since 1981 the Teacher Explanation Project has conducted a series of studies to determine whether teachers who provide explicit explanations about how to use reading skills as strategies to low-group readers will be more effective in developing student awareness of how to be strategic and in improving student reading achievement. Because all the studies required training of one group of teachers, the techniques for intervening with the teachers became a major consideration. This paper traces the historical development of the staff development model, specifies what has been learned about how to train teachers, describes the three-phase staff development model used in the final experimental study, and suggest future staff development directions and problems. It is an aid to other researchers conducting intervention studies designed to develop complex teacher behaviors. (Author)

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THE STAFF DEVELOPMENT MODEL OF THE TEACHER EXPLANATION PROJECT

Joyce Putnam, Laura R. Roehler, and
Gerald R. Duffy

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Abstract

Since 1981 the Teacher Explanation Project has conducted a series of studies to determine whether teachers who provide explicit explanations about how to use reading skills as strategies to low-group readers will be more effective in developing student awareness of how to be strategic and in improving student reading achievement. Because all the studies required training of one group of teachers, the techniques for intervening with the teachers became a major consideration. This paper traces the historical development of the staff development model, specifies what has been learned about how to train teachers, describes the three-phase staff development model used in the final experimental study, and suggests future staff development directions and problems. It is an aid to other researchers conducting intervention studies designed to develop complex teacher behaviors.

THE STAFF DEVELOPMENT MODEL OF THE TEACHER EXPLANATION PROJECT

Joyce Putnam, Laura R. Roehler, and Gerald G. Duffy[1]

The Teacher Explanation Project has been intervening since 1981 with teachers in an attempt to teach them how to be better explainers. During that time, a staff development model has evolved which reflects both our experience in conducting four intervention studies and the insights gained from participating teachers. Because staff development is such an important part of any intervention study and because the way we trained the participating teachers is of particular importance in understanding the nature of the Teacher Explanation findings, this report provides a historical perspective on our staff development model, a description of what the model currently looks like, and a look ahead to the staff development problems that are as yet unresolved.

Rationale

Why should a research project that studies teacher explanation behavior produce a paper on staff development? The answer is straightforward. Our study is an intervention study; that is, we intervened with teachers to change their instructional practices; we taught them practices we wanted them to implement. In short, we engaged in staff development activities and our research has, to some extent, been a confrontation with the classic question of teacher educators: Under what conditions do teachers acquire and use new instructional knowledge and skills?

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However, the rationale for this paper is not confined to the Teacher Explanation Project alone. Staff development has recently become a central question for many researchers who are trying to teach teachers knowledge and skills and link these with pupil outcomes (Brophy & Good, 1986). The major factor in this development is the recent movement from strictly behavioral teacher techniques to complex cognitive mediational teacher techniques. Whereas until recently instructional researchers focused on technical skills that demand little restructuring of teacher's known knowledge (such as calling on students in a certain way, placing the teacher in a particular place in the classroom, stating what is expected as an outcome, providing feedback in particular patterns, etc.), recent instructional research has demanded more of teachers.

The Teacher Explanation Project is a good example. Its core is metacognitive control, both for participating teachers and for students. For the teachers, the intent is to teach them how to recast as strategies those basal reading skills that have traditionally been taught by drill and practice and to explain how to use these strategies to low-group students not only through "front-loaded" modeling and demonstration, but also through responsive elaboration of student cognitive restructuring during the course of lesson interactions. For the students, the intent is to develop a metacognitive awareness of reading as a sense-making activity in which expert readers impose control by using "fix-it" strategies whenever meaning blockages occur during the reading of text. This places a heavy demand on the participating treatment teachers. Having been used to teaching reading as essentially a process of monitoring students through basal text materials and ensuring that skills were "covered" to automatized mastery, teachers were now being asked

to view skills as strategies; to think of reading as a strategic process; to explain the mental processing one does to be strategic; to respond spontaneously to the restructuring of students in the process of interacting with them; to provide differential explanations to different students; to ensure that all students are taught to a working level of metacognitive awareness by providing suitable assistance depending on the students' difficulties; and to ensure that the students develop an understanding of how to use the skill in real text, as opposed to workbook pages or ditto sheets.

The staff development provided in studies such as ours is crucial, both to the success of the research and to understanding the details of the study. This paper, consequently, is important for two reasons. First, it describes what we did to teach our teachers to use explanation techniques, an aspect of the study which is crucial to its success. Second, it provides a basis from which other researchers can proceed in conducting interventions with teachers in other similar studies in the future.

A History of the Teacher Explanation Project From a Staff Development Perspective

The history of the Teacher Explanation Project is usually told from the perspective of the design characteristics and findings associated with each year of the project (see, for instance, Duffy, Roehler, & Wesselman, 1985). In this paper, however, we describe the project's history from the perspective of staff development.

Influences Prior to the Beginning of the Study

The history of the Teacher Explantion Project's staff development model began before the research study itself was initiated. The researchers have identified three major influences that occurred prior to the study. First,

the authors of this paper, as well as several others on the research team, had for several years been involved in various experimental teacher education programs at Michigan State University, including the Teacher Corps and Trainers of Trainers of Teachers. All these programs involved extensive inservice training of participating teachers which, in turn, necessitated a staff development model. The model that evolved from these efforts (and which continued to influence our staff development efforts once we began the Teacher Explanation Project) emphasized heavy amounts of field work, extensive coaching, and involvement of teachers as collaborators (Putnam & Barnes, 1981).

Second, at a later time one of the authors of this paper became involved in the Teachers' Conceptions of Reading Project of the Institute for Research on Teaching. This project investigated whether teachers had conceptions of reading that influenced their decision making when teaching reading in the classroom. The major finding of this project was that basal prescriptions dominated most teachers' conceptions of reading. This finding was substantiated by other research findings (Hoffman & Kugle, 1982; Mason, 1984). At about the same time some researchers concluded that complexities of the classroom made it difficult, if not impossible, for teachers to move beyond mandated prescriptions and that better scripts should be developed (Rosenshine, 1981). We thought this was an erroneous conclusion and conducted a descriptive study in 1981 to develop alternative hypotheses.

Third, a study was conducted to investigate how a second-grade teacher could alter the basal program within the ongoing constraints of a naturalistic classroom setting (Duffy, Roehler, & Reismoller, 1981). Two teachers taught all the reading and language arts in the same second-grade classroom using the same mandated basal program with the regular classroom teacher

teaching during January and the researcher-teacher teaching during February. Qualitative data were collected to describe how each teacher used basal materials. Findings suggested that teachers could successfully move beyond the basal program approach by altering both the sequence of lessons and the format of the lessons, by integrating reading and language arts lessons, and by adding explanations to lessons. We concluded that teachers could be taught to alter the prescriptions provided by basal reading programs.

The Early Development of the Staff Development Model

The results of the above descriptive study were the basis for the content of the staff development provided in the first three years of the Teacher Explanation Project. The interventions provided in those three studies is described below.

The 1981-82 study. The first Teacher Explanation Study was a pilot in which four second-grade teachers, all considered novices in the use of explanation behavior, were taught to add explanation behavior to their ongoing basal programs (Duffy, Roehler, Book, & Wesselman, 1983). The four teachers and their respective researcher-coaches collaboratively developed lessons that were subsequently taught by each teacher. Each researcher was a teacher educator and was considered qualified to provide the coaching. Findings showed that, whereas three of the teachers were successful in providing more explicit explanations (the fourth teacher did not actually use the strategies due to excessive problems in management), one of the three teachers had students who gained significantly more than the others. This led to an analysis of the staff development procedures employed by the four researcher-coaches to determine why this occurred (Roehler, Wesselman, & Putnam, 1983).

The findings indicated that all researcher-coaches provided information, a model, and opportunities to apply what was modeled; however, one researcher-coach, whose teacher produced the most achievement among low reading group students, did these things in a three-stage sequence while the other three researcher-coaches provided the information in one stage. In stage one, providing information, the most successful researcher-coach activated the teacher's prior knowledge and connected the new knowledge about explanation to the activated knowledge, used examples and nonexamples (examples that do not meet the criteria for the concept) to articulate the new concepts, and provided opportunities for the teacher to verify the new knowledge through self-ratings of his teaching performance.

In stage two, modeling techniques, the researcher-coach modeled the explanation using the content of the lesson to be taught next, talking aloud about the process one goes through to plan such a lesson. The think-aloud procedure included positive examples, as well as nonexamples noted from other lessons the teacher had taught. The teacher then used the model to build his own lesson, which he subsequently taught while the researcher observed. In stage three, teacher application, the researcher-coach gradually diminished the amount of modeling in the planning of subsequent lessons as the teacher gradually assumed more responsibility. The three-stage sequence employed by this particular researcher-coach seemed to allow the teacher the time to place the instructional strategy within his instructional context and to gradually internalize the planning process. Therefore, these three stages served as the basis for the intervention treatment of the next study.

The 1982-83 studies. An experimental classroom study involving 22 fifth-grade teachers and a case study involving one third/fourth-grade teacher with expertise in explanation behavior were conducted during the 1982-83 school

year. The experimental study and its staff development components will be discussed first, followed by the case study. Implications for staff development will conclude this section.

In the experimental study, 22 fifth-grade teachers were randomly assigned to treatment or control groups in September of 1982, with the treatment teachers receiving five intervention sessions designed to help them implement explanation behavior during their reading instruction in low reading groups (Duffy, Roehler, Meloth, Vavrus, Book, et al., 1986). The three-stage staff development model (presentation of information, modeling, and application) which evolved from the 1981-82 study served as the basis for the 1982-83 intervention process. Its refinement resulted in the researchers' providing teachers with new information about explanation behavior during the first intervention session. This included activating teachers' prior knowledge of reading skill instruction and connecting it to the new knowledge, providing a rationale for the components of explanation behavior, providing teachers with materials to read in which explanation behavior was modeled, and answering teacher questions.

During the second session, conducted two weeks later, the teachers discussed the explanation model and developed sample lessons in which teacher modeling of the cognitive processes associated with skill use were emphasized. The third session, conducted a month later after each teacher had been observed teaching a lesson, focused first on providing opportunities for teachers to use explanation behavior in their reading skill lessons, then on providing feedback on the previously observed lessons, and finally on developing jointly planned lessons for the next skill to be taught.

The fourth intervention, conducted in January, focused on teacher modeling, with teachers' receiving feedback about the modeling they employed

in the previously observed lessons and comparing their instruction with the students' transcribed interview responses about lesson content that were collected immediately following the lesson. The fifth and last intervention, conducted in February, focused on the interactive component of explanation lessons, with teachers' developing (jointly with researchers) the interactive component of a lesson and receiving feedback about previous lessons through examination of lesson transcripts.

The 1982-83 case study was a yearlong study of a researcher-teacher who was considered to be an expert in explanation behavior (Putnam & Duffy, 1984). He taught reading instruction two mornings a week to a low group of third/fourth graders. A second researcher observed and taped all the lessons and directed stimulated recall sessions following instruction.

The two 1982-83 studies heavily influenced our staff development model. First, the experimental study showed that teachers who incorporated explanation behaviors into their reading skill lessons had students who were significantly more aware of lesson content than pupils of the teachers who did not do so. Through the end-of-year interviews, we also discovered that some teachers used explanation behaviors only when observed. We also found that other teachers had adequate knowledge of explanation behavior when interviewed but displayed inadequate explanation behaviors during observed instruction. These additional findings, together with the fact that no significant achievement gains in reading were found, led us to conclude that a more refined staff development model was needed to overcome the factors constraining teacher use of teacher explanation (Duffy & Roehler, 1986). Additionally, the case study of the researcher-expert revealed how difficult it is to develop effective interactions spontaneously during lessons, further suggesting the need for improved staff development. These findings led to a

descriptive study in 1983-84 which had as a primary purpose the refinement of the staff development model so that future interventions with teachers could be more effective.

The 1983-84 descriptive study. The 1983-84 study was a descriptive follow-up to the experiment conducted in 1982-83 (Roehler, Duffy, Vavrus, et al., 1986). It involved seven teachers, three of whom were treatment teachers in the 1982-83 study and four of whom were control teachers in that study. A primary purpose was to refine the staff development model. Staff development innovations included using novice-experts sets, each set pairing a teacher with a researcher-teacher educator. The teacher's daily planning for skill lessons was monitored; videotapes were added to presentations to provide more tangible examples of explanation behavior; teachers received immediate feedback after each observed lesson; and each teacher's student-interview transcripts were reviewed by the teacher-researcher team at each intervention session. In addition, the three-stage sequence described earlier continued to be used. The major change, however, was a greater emphasis on the concept of coaching found in the third stage, in which the researchers created for their respective teachers a more supportive environment, provided more individualized assistance, and developed more teacher ownership of explanation behavior (Joyce & Showers, 1983).

The goal was to develop teacher knowledge of explanation behavior and its place in the instructional sequence, to develop teacher thinking about explanation behavior, to change teachers' cognitive structures about lesson development, and to move teachers from researcher-regulated to self-responsibility regarding lesson development and implementation. The role of the coaches was to provide technical assistance, to assist teachers in lesson analysis, to critique lessons, to assist teachers in critiquing their own

lessons, to assist teachers as they broadly planned the next month's lessons, to provide common units, and to develop a collaborative spirit among both the teachers and the researchers involved in the study.

Analysis of the outcomes and feedback data from this descriptive study led us to conclude that in stage one, where the basic information is provided, the written materials (as well as oral) were found to be useful, as were opportunities to discuss the content of these materials and to clarify concerns. The inclusion of examples and nonexamples of appropriate instructional behavior and having teachers assess their own instructional performance during explanation lessons were also found to be critical. In stage two, in which information was modeled, both written models and videotaped models of explanation lessons were found to be useful. Classroom demonstrations of explanation behavior were also provided when requested by teachers. Critical features of the modeling stage included think-alouds by the coach during lesson development and an emphasis on the interactive sections of the lessons in which students gradually assumed more responsibility for skill usage. In stage three, in which teachers apply information, coaching by researchers was found to be useful. The critical features included a supportive environment created by the coach-researcher for each teacher and a gradual diminution in the assistance provided by the coach-researcher as the teacher assumed more responsibility for lesson development and implementation.

Summary. At the end of the 1983-84 study, we believed that we had the foundation for a staff development model that could be used to help teachers learn to use complex instructional behaviors. The model included the three stages of (a) providing information, (b) modeling the techniques, and (c) applying the information. This model was analogous in many ways to the

instructional model that emerged from our study of teacher explanation of reading skills; that is, just as students gradually restructured their understandings about how to use skills as strategies over a long period of time in response to explicit presentation of information and guided application of that information, teachers gradually restructured the information about how to be better explainers over a long period of time in response to explicit presentations of information and guided application.

While our own experiences with staff development, as chronicled above, were valuable resources in the development of the model that ultimately guided the intervention used in the 1984-85 study, research conducted by others also influenced this development. These additional research results, as well as our analysis of our own staff development efforts, led to a reconceptualization of our staff development model.

Reconceptualization of our Staff Development Model

Our early efforts in the Teacher Explanation Project confirmed that it is difficult to design staff development to bring about complex changes in teacher thinking and behavior. We learned about variance in teacher use of new knowledge and the importance of a well-developed model of teacher change. Other researchers (Oja and Ham, 1984; Showers, 1985) reported similar findings indicating that their teachers changed at varying rates and in different ways. Teachers, however, do change. This led us to decide that, even though the staff development problem was complex, it was worth the effort.

Analysis of our past findings showed that we needed to consider two factors in the reconceptualization effort. First, we needed to bring about change in elementary teachers that was significant enough to cause significant changes in student achievement. Second, teacher change needed to

occur as early as possible so that the students would have the maximum opportunity to be affected by the teacher's new knowledge and behaviors.

Analysis of current literature and our own staff development efforts led us to incorporate into our intervention four staff development factors that were necessary for a successful intervention study. We had to (a) simplify initially the complexity of the content of the study, (b) recognize and use positively the influences of the schools, (c) develop more strongly teacher ownership, and (d) expand the three-stage model we had used in our earlier studies. Each of these factors is described below.

Simplify complexity. The first factor involved the initial simplification of the complex new knowledge and behaviors associated with explaining skills as strategies. For example, six steps were identified for the process of recasting skills as strategies: (a) evaluate basal; (b) select skill; (c) analyze skill and identify process; (d) complete task description, identifying what to say; (e) introduce skill, including what, why, and how; and (f) identify how to provide instruction. Not only did we want the teachers to understand and use explanation techniques, we also wanted them to be aware of what they were doing and the impact of their strategy instruction. To help teachers internalize this new knowledge, we simplified the new concepts and behaviors during the earlier intervention sessions, gradually increasing the complexity in subsequent sessions. Also, we made extensive use of coaches to provide teachers with individualized instruction and with personal support while also emphasizing the collaborative spirit of the task.

Influences of the school. The second important factor was the impact of the school context on teachers. An in-school environment supportive of the changes being developed with teachers was needed, as noted by Miles (1983),

who pointed out the importance of administrative support, as well as hard work, commitment, and mastery in bringing about application of an innovation.

Our previous work, as well as that of others (Griffin, 1983), found that the school environment is often complex because of competing agendas and points of view. An analysis of our teacher interviews from the 1982-83 and 1983-84 studies showed that the researchers' agendas and goals were somewhat different from those of teachers, principals, and curriculum (reading) specialists. For example, teachers are influenced more by immediate needs and they may resist solving complex, long-range problems. Curriculum specialists may perceive their role as one of monitoring teachers' exact use of the textbook, whereas principals often have political and/or teacher evaluation agendas.

As competing agendas are a natural part of the school context, it can be assumed that the researchers, teachers, principals, and curriculum specialists all had varying views about the purpose of the research project. Thus, to create a supportive context, the researchers had to link similarities among differing points of view and tie the innovation to real problems of practice within a given context. Our 1984-85 study included 18 schools, 18 principals, 18 reading specialists, and 20 teachers. As researchers we met extensively with all personnel to establish one shared goal for the study, which was the improvement of achievement and awareness scores of low-group readers.

Developing teacher ownership. The third factor was the need to develop teacher ownership of our study. Cross (1981) suggested that most adult learning begins because of a problem or a responsibility. Consequently, to develop stronger commitments, we included coaching in intervention sessions. All sessions began with coaching about the last lesson taught and each

model of the information, and providing opportunities to apply the information and get feedback.

Each of the three phases has critical features that led to more intense involvement of the teachers. A description of these follows, particularly as they were incorporated into the 1984-85 study.

Phase I: Task identification. In Spring 1984 information about the research project was provided to personnel in the school districts. Specifically, administrators and teachers were given information about the Teacher Explanation Project and how explanation strategies contribute to the improved reading achievement of low-group readers. Teachers who were interested in low-group readers were asked to volunteer for the research project.

In August 1984, prior to the opening day of school, the research team met with the volunteer teachers to discuss the problems of low-group readers and to review the data from earlier research on explanation behavior. The final report of the 1982-83 study was the basis for these discussions. At this point the group began to move into Phase II, assessment.

Phase II: Task assessment. The first intervention session in early September 1984 was the occasion for assessing and developing a common set of knowledge about low-group readers. Specifically, differences were noted between the Teacher Explanation Project's approach and the host school district's former emphasis on management by objectives and their current centralized approach based on the adoption of a single basal text.

As this information was reviewed, it became apparent that teachers also felt that, in their own individual ways, they had responded to the low-group reader. For example, they said they spent more time and used more materials for this group. It was an appropriate time to discuss how teacher explanation and basal adjustments were a different response to the problems.

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Careful attention was given to helping teachers link the new Teacher Explanation Project ideas to past experience while keeping the focus on what teachers needed to do differently.

Phase III: Task intervention. As the discussions between researcher and teachers evolved, the question "What can we do to change things for the better?" was raised by the teachers. At this time, the first stage of providing information in the intervention phase was initiated. The three stages in the intervention phase did not occur in a linear fashion, but rather in cycles across time. For instance, an understanding of how to provide explanation developed gradually over a six-month period; that is during that period, information about individual components of explanation (presentation, modeling, interaction, and evaluation) developed in their own cycles. Modeling and application first occurred for one component and then another. Taken together, a gradually more complex understanding of explanation behavior evolved.

When information was presented in the first stage, it included new information about the innovation (in this case, an explanation of skills recast as strategies) for the teachers in the treatment group. For example, first the skill of drawing conclusions found in the basal was reviewed wherever it occurred in text. Second, the materials were drawn together and the best example selected. Third, the skill was analyzed in terms of what the skill is, how it is used, and when to use it. Fourth, the recast skill was task analyzed identifying the steps in the new strategic process. Fifth, the strategy was introduced in the lesson emphasizing where the strategy fit in the larger category of problem solving including what the strategy was, how and when to use it. Finally, the teachers developed the language for

modeling the mental processes related to the strategy and examples of how to respond to typical pupil responses.

Three factors contributed to the success of the information received. First, teacher background knowledge about the content being developed needed to be activated; second, dissonance sufficient to create a challenge--while not being frustrating--needed to be presented; and third, ties needed to be developed for future use. In our study of explanation behavior, we activated teachers' known knowledge about skills instruction through discussions and baseline observations of their skill lessons. Dissonance was created by comparing the teachers' observed skill lessons to videotaped lessons of model explanations provided by an expert. Student interviews following the baseline observations also created dissonance by showing that what the students reported they had learned during reading skill lessons was not always what the teachers thought they had taught. Ties to future use were created by showing videotaped lessons in the context of both the typical basal lessons and typical classroom settings.

These critical features were included whenever new information was presented to the treatment teachers. Instead of using baseline observations and baseline student interviews to activate knowledge, we used the most recent observation and its associated student interviews. Similarly, dissonance was created by showing videotaped explanation lessons and discussing with teachers their own lessons; and ties to future use were made as each teacher and researcher-coach worked on lessons to be taught in subsequent lessons.

In summary, the first stage of Phase III focused on presenting new information, including the activation of known knowledge; creating dissonance and an associated challenge; and developing ties to future use. The complexities

of explanation behavior required that information be separated and developed gradually within the larger concept of strategic reading.

The second stage, presenting a model of the information, focused both on the process of developing lessons and their implementation. Think-aloud strategies and videotapes of experts' lesson planning and instruction were used during the earlier interventions and the typed transcripts of the teachers' own effective and less effective explanations were used in the latter interventions. The focus of this stage was always the process of lesson development and implementation.

The third stage, providing opportunities to apply the information, centered around the participants' gradual internalization of explanation behavior. The focus was on helping teachers use the new information in a supportive yet challenging environment while talking about it and writing about it with the researcher-coach. While the researchers provided support, the responsibility for decision making in explanation lessons was gradually transferred from researcher to teacher. As responsibility was gradually transferred, the feedback moved from being researcher-initiated to being teacher-initiated. Again, the opportunities to use explanation behaviors occurred over the school year.

This phase of the staff development model is complex. Effective implementation requires recurrent cycles of presenting, modeling, and applying in which researchers carefully assess the teacher's restructuring and, based on that assessment, offer another intervention cycle until the teacher's restructuring is sufficient for effective implementation.

The Reconceptualized 1984-85 Staff Development Model

Whereas the staff development model used in the final study of teacher explanation in 1984-85 was similar in many ways to the model employed in the

three earlier studies, the above reconceptualization resulted in several changes. First, the progression of interventions was altered. More intervention sessions took place than in previous years, with the bulk of them held early in the school year. The content was initially simplified to reduce the complexity of the information load. Second, the researchers made a concerted effort to communicate the goal of the research project to all affected persons and to present the research project from a perspective consistent with the agendas held by the persons involved. In the host school district this primarily involved emphasizing the project's potential for raising the district's reading achievement test scores.

Third, the 1984-85 intervention included many efforts to involve teachers and to build a collaborative spirit. The intent of these efforts was to ensure teacher ownership and commitment to the goals of the project. Fourth, the previous three-stage model was expanded to include emphasis on task identification and assessment prior to providing information about the exploration innovation itself. By involving participating teachers in identification of how the work would contribute to their ongoing efforts and how it was different from current practice, teacher commitment was more likely to result. Finally, the intervention phase itself was improved. This was primarily accomplished by strengthening the teacher-coach relationship. More formal coaching sessions were held during regular scheduled intervention sessions and informal coaching was encouraged in telephone conversation and following classroom observations.

Descriptive Observations Regarding the Staff Development Model Used for the 1984-85 Experimental Study

The reconceptionalized staff development model described above was applied to the 1984-85 experimental study. This study involved 20 third-grade

teachers for one academic year, 10 in a treatment group and 10 in a treated control group (Duffy, Roehler, Meloth, Polin, et al., in press; Roehler, Duffy, Putnam, et al., in press). Sessions were held with teachers to counteract possible halo effects in the treatment group. In the treated control group sessions, one article on management, which was also used in the treatment group, was discussed. An analysis of the staff development efforts revealed complexities and constraints in implementing an intervention with teachers. The complexities and constraints for each phase are presented below.

Phase I: Identification

Complexities. It was difficult for researchers and teachers to reach agreement on the purpose of the study. Whereas teachers and researchers agreed that low-group readers needed help, finding an agreed-upon solution was difficult. The professional and personal agendas of all participants needed to be mediated throughout the year in order to maintain genuine support for the study.

Constraints. Time was the biggest constraint. It is important to develop mutual ownership, but this takes time. We tried to control this constraint by having multiple meetings in which discussions centered on identifying the goals and potential benefits of the study.

Phase II: Task Assessment

Complexities. The main complexity in the assessment phase was in helping teachers differentiate between their past practice and what we were teaching them. Teachers' and researchers' perceptions of the teachers' current teaching practices and the new practices needed to be accurate so that everyone involved shared the same perceptions and were working toward the

same goal. For example, some teachers thought they were being explicit when they were not, thus indicating a misconception about explicitness.

Constraints. The biggest constraint in this phase was the teachers' past experiences with low-group readers. In general, the teachers had not been successful with this group. Their past frustrations in trying to respond to these learners caused them to be tentative about how much to invest in yet another attempt.

Phase III: Intervention

Stage One: Information Giving

Complexities. Because explanation behavior is complex, developing teachers' understanding of explanation behavior required an initial simplification of the key elements, a gradual development of the complex interaction between both these elements and the larger context of strategic reading, and the continual assistance to teachers about how the key elements served as an integrated and efficient instructional tool. Teachers often confused concepts like "strategic reading" and "strategic instructional processes," so that some teachers did not distinguish between the two ideas until quite late in the intervention.

Constraints. The constraints on information giving were time, the school district's mandated basal series, and the difficulty teachers had internalizing explanation behavior. Because we were constrained by the nine-month school year, we front-loaded explanation information by providing the bulk of the interventions during the first two months of the school year. Because the school district mandated a single basal reading series for all teachers, we presented the information from the perspective of that basal series. Because effective explanation behavior initially places a heavy cognitive load

on teachers, we tried to minimize this load by providing an analysis of the skills presented in the basal program and suggestions about how to explain them. This analysis included a list of the skills in the basal text that could be recast as strategies and a suggested task analysis of the critical features of the skills that could be used to assist lesson planning and to implement the "how" component of explanation behavior.

Stage Two: Modeling

Complexities. Complexities for modeling revolved around the difficulties associated with observing the mental processes of strategy usage. We attempted to make this invisible process visible through think-aloud situations that included written think-alouds, video think-alouds, and teacher-researcher team think-alouds.

Constraints. The constraints on modeling came from three sources: the artificial aspects of think-aloud strategies, the mandated basal program, and the subtle differences between modeling answers to comprehension questions and modeling the mental process used to figure out the answer. The artificial aspects of think-aloud strategies were neutralized by the establishment of collaborative teams. Both researchers and teachers had opportunities to think aloud about planning and teaching situations while their partners supported and critiqued.

The mandated basal program was a constraint because it followed a model of lesson development where the outcome was automatic use of skills. This was counter to the explicit strategic process model. (Duffy, Roehler, & Putnam, in press). This constraint was neutralized by illustrating the difference and by providing ongoing discussions that highlighted these differences. The subtle differences between answer setting and focusing on "how to" was developed through collaborative teams in which partners critiqued

each other. Continual reference was made to the differences between the answer and the process by which one gets the answer. Discussions within the collaborative teams focused on these subtle differences, with teachers and researchers reminding each other of this focus.

Stage Three: Application

Complexities. The complexities of application centered around the gradual transfer of responsibilities to the teachers and the gradual development of the teachers' ability to critique their own explanations. During this stage teachers were placed in situations in which they were given opportunities to critique lessons as if they knew how to develop and implement explanations, although they were actually only developing their understandings. Accomplishing this required carefully thought-out interventions based on ongoing feedback from teachers regarding their progress. The introduction of lesson critiquing occurred gradually and only when teachers felt knowledgeable about certain aspects of explanation behavior.

Constraints. The constraints on application included the limitations of mandated basal series and the possibility that teachers might revert to established patterns of decision making because responsibility was shifted too soon or because self-critiquing occurred before new knowledge was firmly established. The basal program was a constraint because it did not contain the needed information for explanation implementation. In addition, the basal program was oriented for the development of automatic usage of skills (rather than strategic usage). We accounted for the basal constraint by providing supplementary materials. These materials noted the basal program's limitations and provided information needed to supplement explanations.

Another constraint was the danger that teachers might revert to old instructional patterns or that they would restructure the innovation so

drastically that it would look like the old pattern. For instance, teachers struggling with the innovation found it hard to ignore students who preferred the old instructional patterns or gave severe critiques of their lessons. We attempted to neutralize this constraint by discussions with the teachers during the interventions and by asking them to enlist the support of their students when explanation lessons were taught.

Implications

Several implications are associated with our experience in conducting the various interventions associated with the four years of the Teacher Explanation Project. These implications are discussed below in term of lessons learned, unanswered questions, and future directions.

Lessons Learned About Staff Development

Five lessons were learned about designing the staff development efforts associated with intervention studies in which complex teacher behavior is the desired outcome. First, and most important, is that the staff development effort must be quite elaborate when the goal is to develop cognitive understandings in teachers. Brief and relatively simple interventions are often effective when the outcome focuses on technical teacher behaviors and when prescriptions can be followed with little variation, but the development of cognitive skills and independent decision making demands at least a year of staff development. During this time, the traditional practice of telling teachers what needs to be done must be supplemented by sensitive, individual assistance that is responsive to each teacher's particular background, current context, and emerging understandings of what is being learned.

Second, closely related to the time factor is the need to enlist teacher support for the innovation. Whereas, teachers can often learn certain

technical skills while being relatively uncommited, the development of complex and sophisticated thinking skills such as those associated with teacher explanation require a great deal of teacher involvement. The enlistment of this support comes from two sources. The first is relating the innovation to the teacher's background experience and to the agenda(s) which dominate the teacher's concern. The second is sharing with teachers the rationale for the staff development model itself and inviting teachers to alter and modify the model in ways which they think will improve the likelihood of success.

Third, with complex interventions such as teacher explanation, the innovation cannot be isolated and taught independently of other aspects of instruction. For instance, although the focus of the Teacher Explanation Project's innovation was a lesson plan format which specified explicit presentation of information, the intervention could not be confined to the format alone. It was also necessary for teachers to develop commitment to and understandings of the ultimate goal of reading instruction, the nature of the reading curriculum, the context in which reading instruction should occur, the supporting activities that occur during reading instruction, and the importance of management. In short, teacher explanation techniques needed to be presented within a holistic instructional framework.

Fourth, interventions with teachers are, in many ways, analogous to providing explanations during reading instruction. The information should be clearly presented, especially that information about situational knowledge (when the knowledge is to be used and why it is appropriate to do so). When information is presented, it should be characterized by cohesive ties to the teacher's past knowledge and experience and should foreshadow forthcoming situations meaningful to the teacher. Modeling should be both explicit and

closely analogous to the contextual conditions under which the teacher will use the innovation. The guided practice must be extensive and characterized by a gradual transfer of responsibility from the researcher to the teacher, with the researcher responsively providing spontaneous explanations during guided practice on the basis of evidence about how the teacher is understanding the innovation. Finally, the teacher must be given ample opportunity to apply the innovation in his/her own classroom.

Finally, coaching is the most important role played by the researcher. Rather than being a dispenser of information and an evaluator of performance, the researcher assumes a role in which, on an individual basis, the teacher is provided with assistance as the innovation is developed, practiced, and applied.

Unanswered Questions

Although our staff development model as applied during the 1985-86 study was successful, three unanswered questions about staff development remain. The first focuses on the varying success of the staff development, the second on the process of transfer of knowledge, and the third on the conflicts between experimental research design procedures and staff development needs. By far the most perplexing problem is, Why were we quite successful with some teachers and less successful with others? Where as, hypotheses have been generated about this variation (Duffy & Roehler, 1986; Duffy, Roehler, & Putnam, in press), it is nevertheless true that we do not know how to develop complex decision-making behaviors in teachers to a uniform level of competence.

Second, and closely related to the first, is the problem of transfer. Although the coaching model employed in the study was very successful,

especially when combined with the three stages in the intervention phase of the model, the transfer of responsibility from the researcher to the teacher was nevertheless problematic. We were never sure when to attempt this transfer or the best way to accomplish it. It became clear that teachers first viewed the innovation from a self-centered perspective of what it demanded of them before they were able to base their decisions on what students were thinking; however, there was no clear way to determine when teachers began to move away from the self-centered perspective and how, therefore, to begin transferring more of the instructional responsibility from the researcher to the teacher.

The third problem involves the conflict between experimental design procedures and staff development needs. Current thinking suggests that a school is the basic unit for successful staff development rather than the individual or district (Griffin, 1983). It seems that when teachers must act as individuals, they have a harder time successfully implementing an innovation due to the socializing effects of the school; however, some evidence supports the idea that teams of teachers within a school rather than an entire building can successfully implement innovations. For instance Putnam and Barnes (1981) found that teachers who worked in teams of two or more demonstrated the use of significantly more new teaching strategies than teachers who did not work in teams. Putnam (1985) found that teachers working in teams continued to implement and expand the use of strategies that had been taught in staff development experiences.

Therefore, teacher change involving complex thinking of the nature involved in this study could have been facilitated if teams of two or more teachers from a given building had worked together. For a number of reasons this did not occur. For example, limitations included the number of

volunteers, the tight research designs that drive experimental studies, and the random assignment of teachers to control and treatment groups called for by the research design. Consideration of these three problems will contribute to our further understanding of how to design experimental treatments that reflect sound staff development principles. This will contribute to our confidence in the results of school-based studies as the problem of poor treatment (staff development) effects is reduced.

Future Directions to Pursue

These experiences highlight for us the need to create staff development techniques that promote the development in teachers of complex cognitive tasks and independent decision making. These efforts should build on the model described in this paper. Additionally, special attention should be given to the best ways to elicit teacher commitment, to present complex information to teachers, to provide supportive corrective feedback to practicing teachers, and to help teachers transfer knowledge from the staff development situation to regular practice in the classroom.

Conclusion

Staff development is a factor that has to be considered in any research study concerned with complex teacher change. This paper describes what we did to control this factor. We taught our teachers to understand new concepts and to place those new concepts into their knowledge base about reading instruction. Helping teachers to internalize this information required detailed planning and implementation strategies similar to the instruction we were asking the teachers to provide for their students. The model and procedures we developed are offered as a basis for other researchers who want to conduct similar interventions with teachers.

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